

MA304 - Exploratory Data Analysis of CPE's Dallas Policing Dataset

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Introduction

This report aims to analyse the data set created by The Center for Policing Equity (CPE) which focus on policing within Dallas, Texas in 2016. The CPE's objective is to use advanced analytics to diagnose disparities in policing, shed light on police behaviour, and provide actionable recommendations to police forces. This report uses extensive data visualization to help breakdown and explore patterns in policing behaviour.

Exploratory Data Analysis

Tackling racial disparities within policing is a key focus of CPE's work. As a result, much of the exploratory data analysis in this report is analysed and broken down by race in an attempt to uncover potential racial disparities in policing.

Comparing officer gender & race vs. subject gender & race



Figure 1: Comparing officer and subject race and gender

The box plots above visualize the gender and race of both officers and subjects. We can observe that the vast majority of both officers and subjects are male. However differences lie within the races of officers and subjects. While the majority of officers are white, the majority of subjects are black.

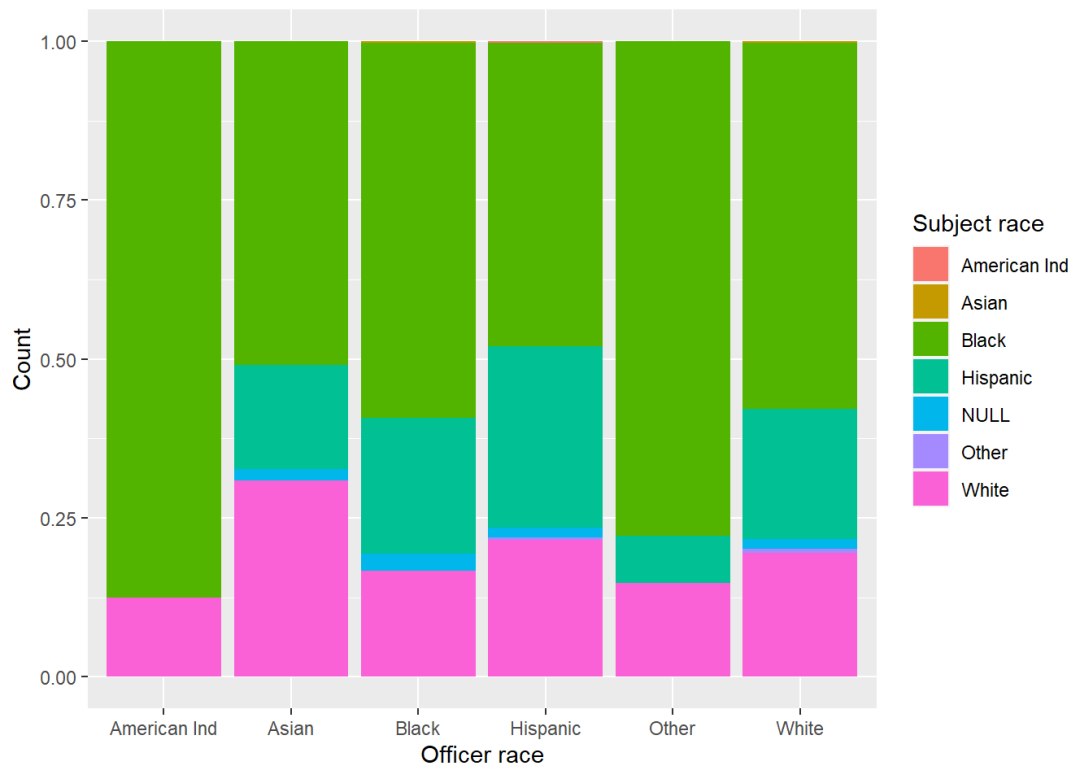


Figure 2: Comparing officer and subject race and gender

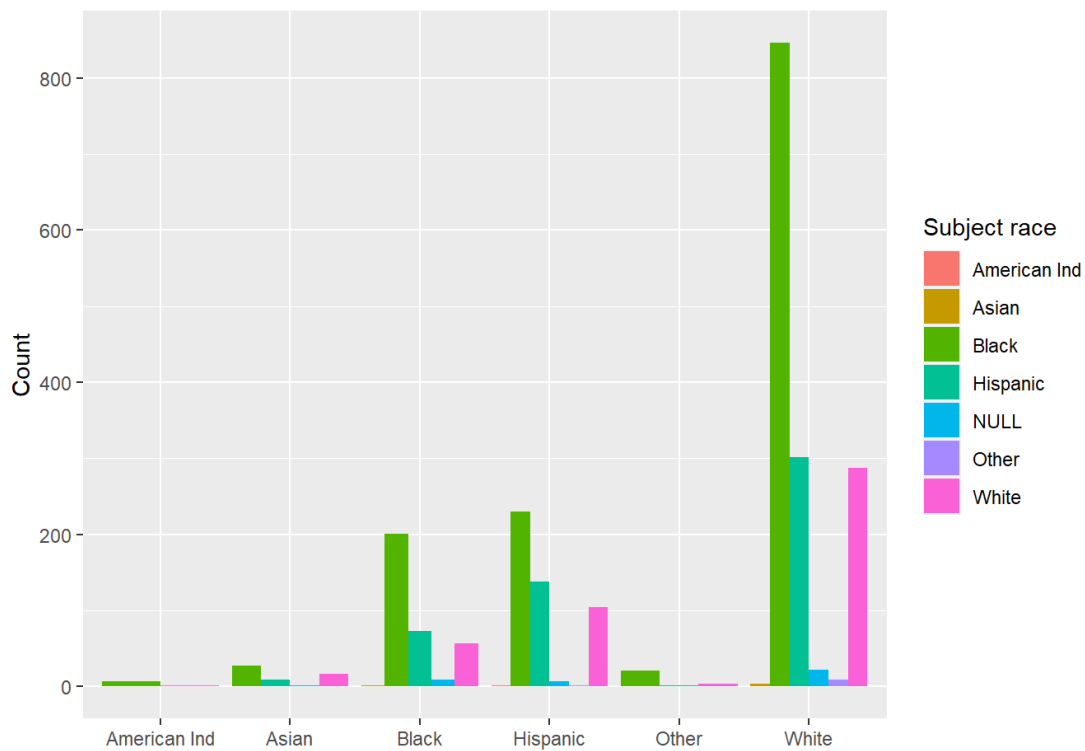


Figure 3: Comparing officer and subject race and gender

The two graphs above have combined the previous information of officer and subject race into more visually comparable information. The second graph in particular clearly demonstrates that the majority of Police interactions have been between white officers and black subjects.

Officer years on force

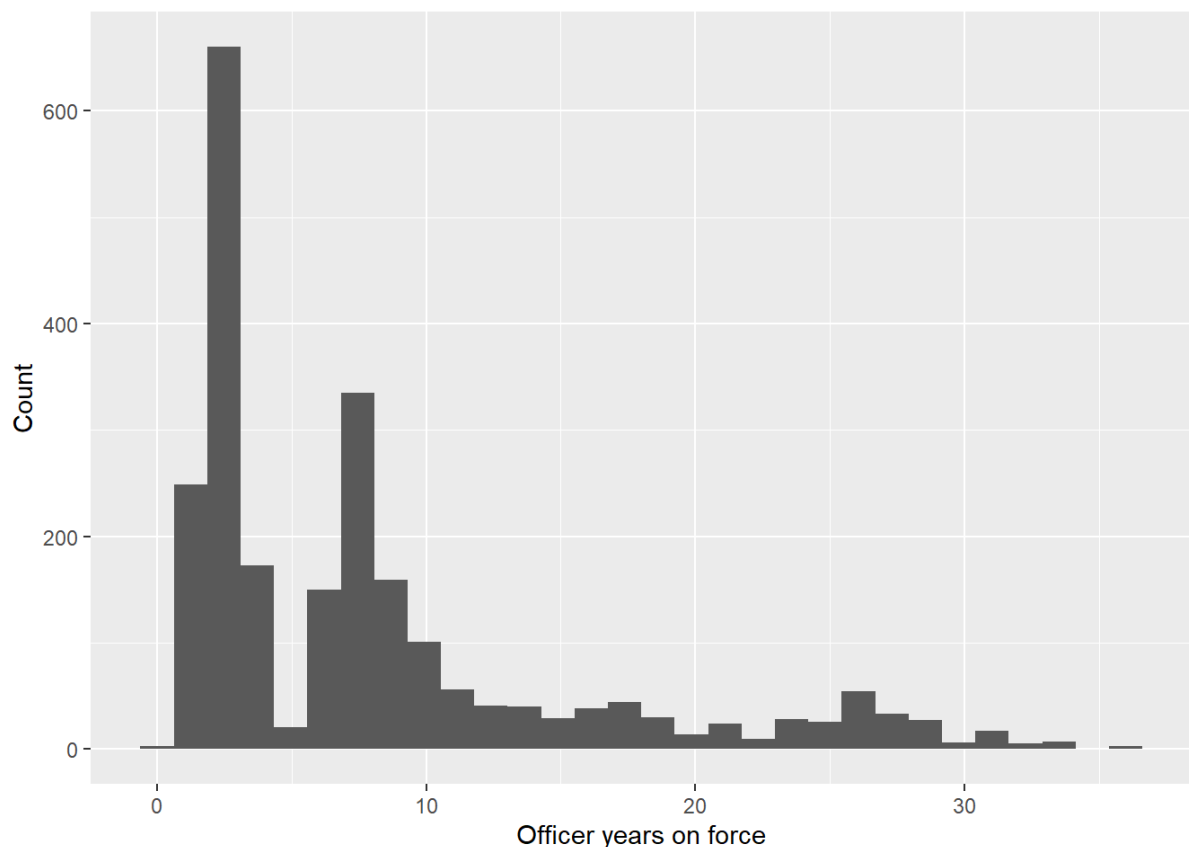


Figure 4: Frequency of officers years of duty

This histogram plots the frequency of officers by their years on the force. We can observe that the majority of officers have served between 1-10 years with a sharp drop off after the 10 year mark.

Officer injury vs. subject injury

The box plots above visualize the proportion of officers and subjects who were and were not injured. From the graph it can be observed that majority of interactions resulted in no injury to either officer or subject. We can see slight differences in officer/subject injuries, with just under 250 officers being injured while over 500 subjects were injured.

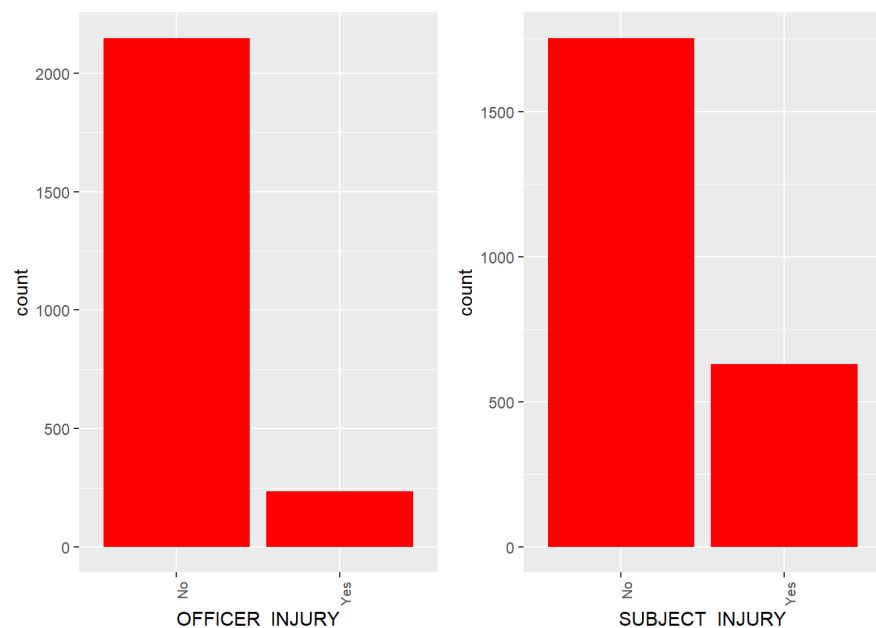


Figure 5: Officer Injury vs Subject Injury

Officer race vs. subject injury

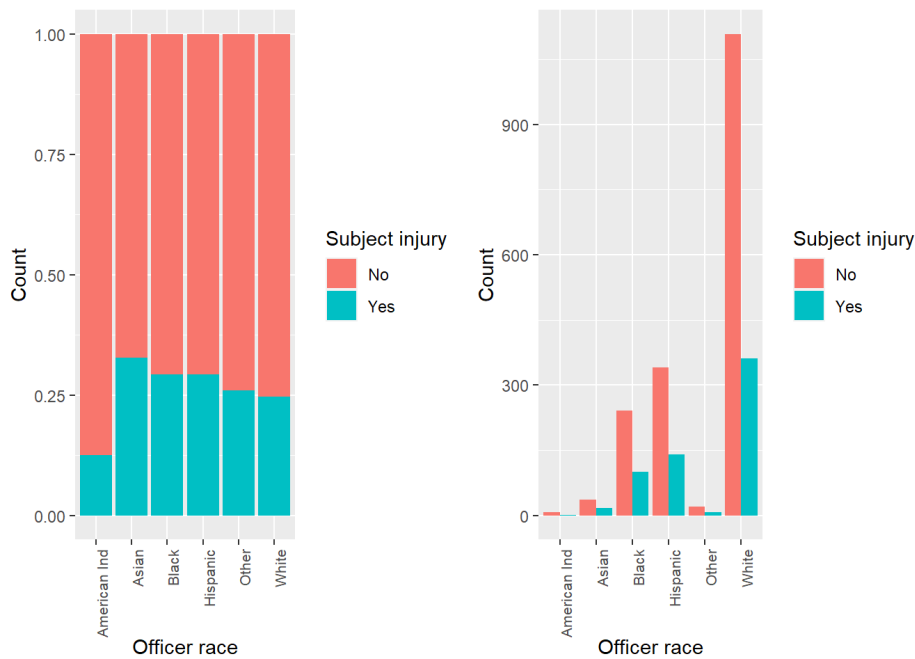


Figure 6: Officer race vs subject injury

The plots above attempt to explore whether there are any disparities between the race of the officer and resulting injury of the subject. It can be observed that regardless of officer race the majority of interactions resulted in no subject injuries. Furthermore, the interactions that did result in injury are proportionate to each race of officer.

Reason for arrest vs. subjects race

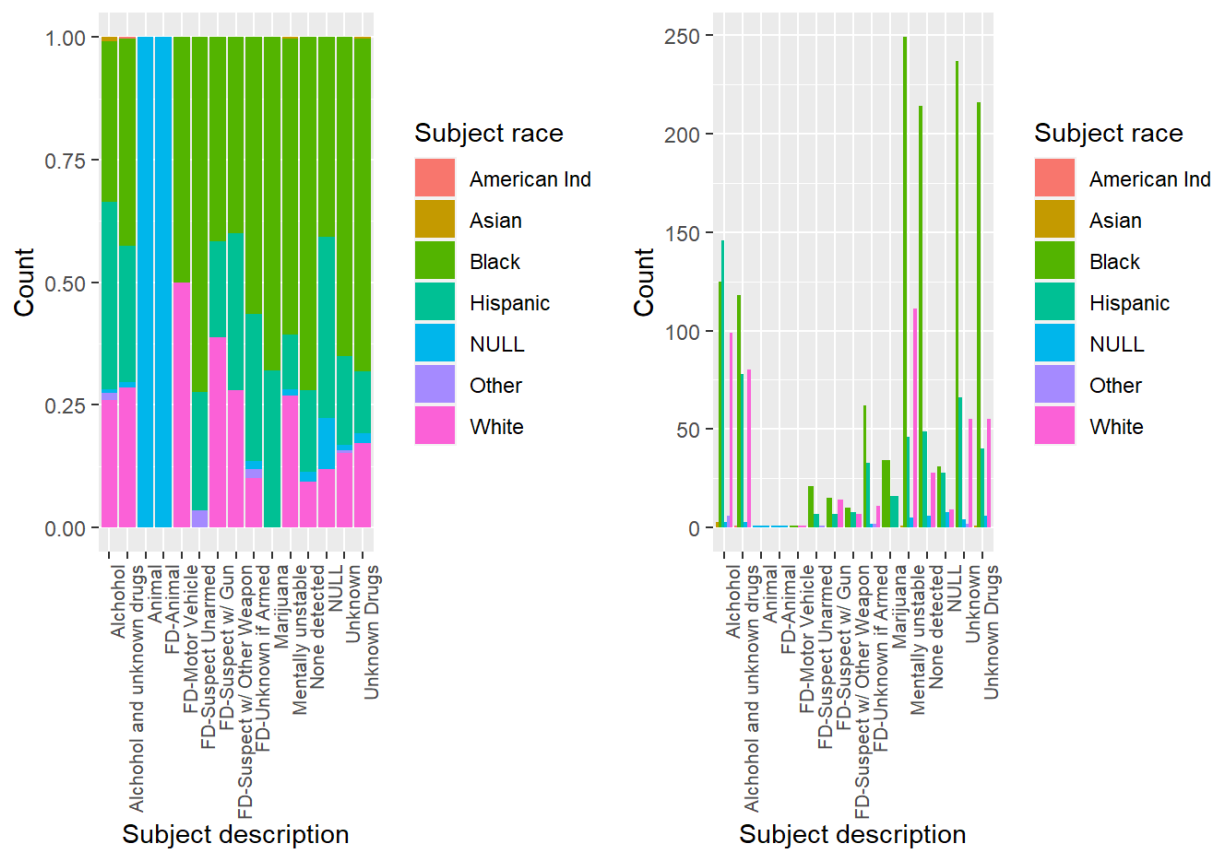


Figure7: Reason for arrest vs subjects race

Breakdown of arrests by area division and race

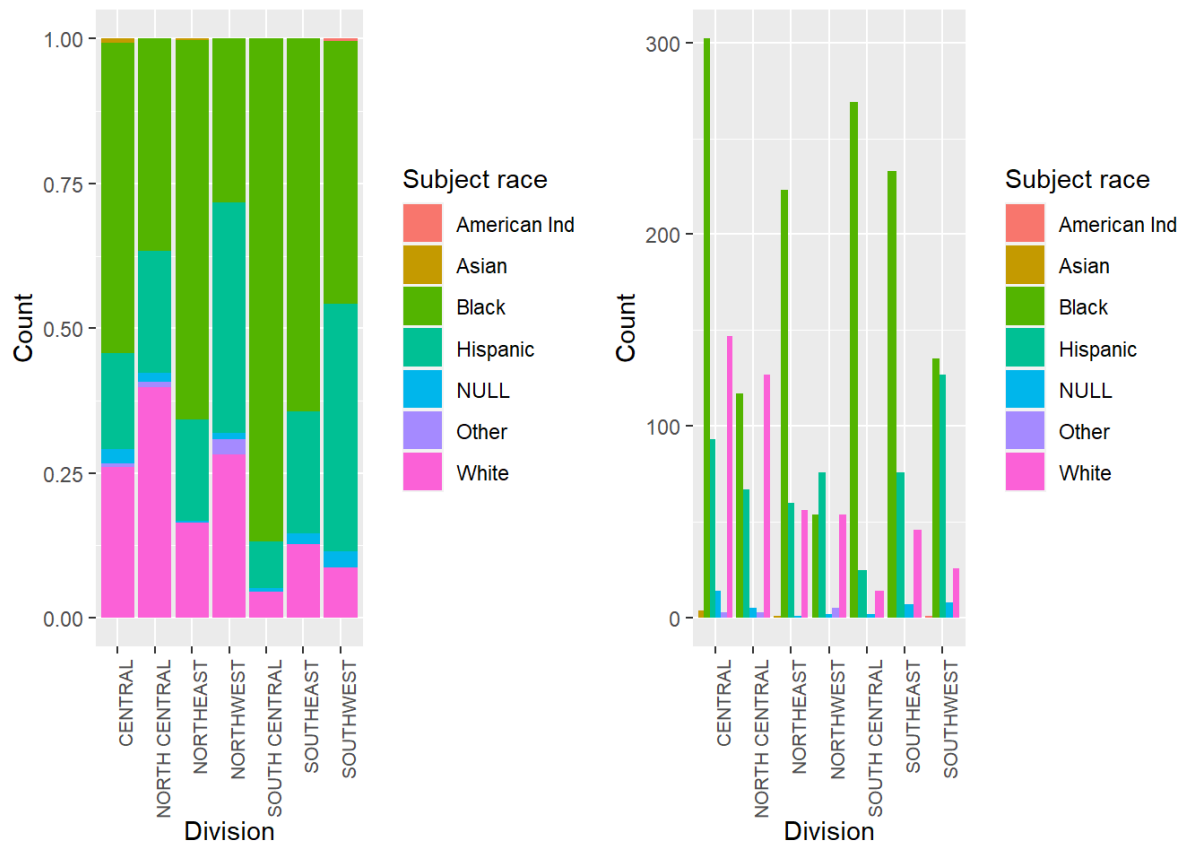


Figure 8: Breakdown of arrest by area division and race

The plots above breakdown the arrest by area division and group by race. The plots show that in all 7 divisions blacks have the highest arrest rate, although in Southwest division it is particularly close between blacks and Hispanics.

Reason for incident vs. officer race

The graphs above shows the incidences that officers were engaged with and is then broken down by officer race. It can be observed that the highest incident reason was to make an arrest, while the second most common was making a service call. The majority of incidences are recorded by white

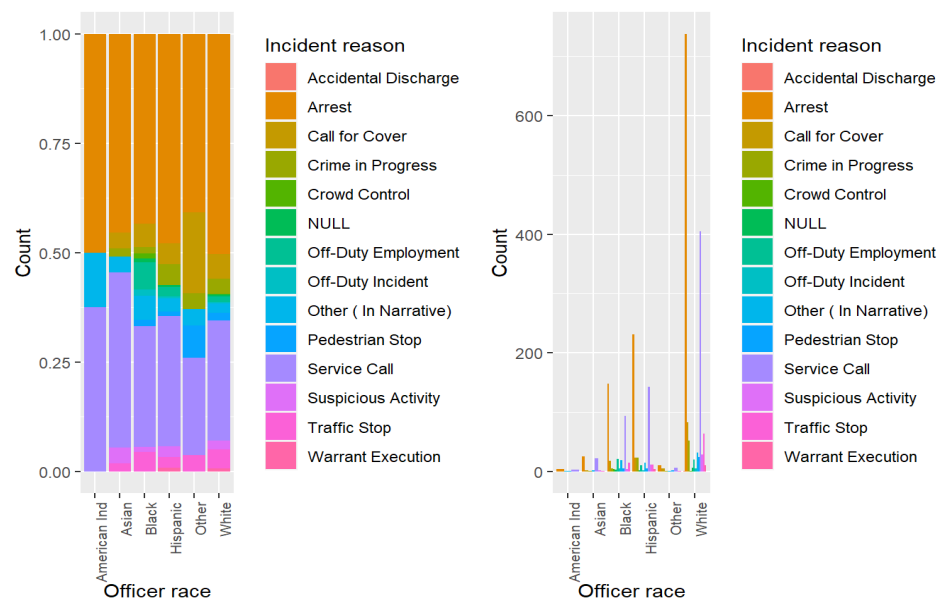


Figure 9: Reason for Incident vs officer race

officers, however this is unsurprising when taking the very first plot into account which shows the vast majority of officers are in fact white.

Reason for incident vs. subject race

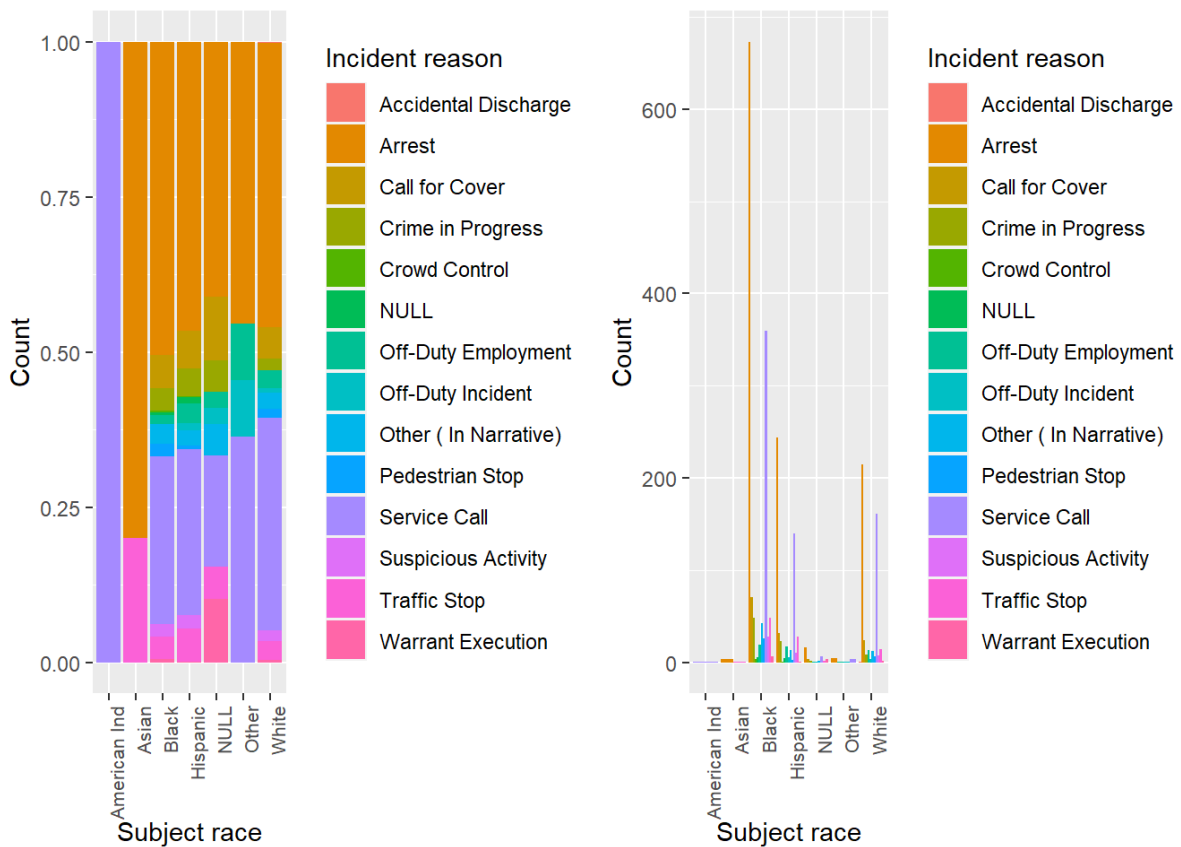


Figure 10: Reason for incident vs subject race

Similar to the previous visualizations, these plots record the incidences however focus this time on the race of the subject. As can be observed, the highest figure is black arrests at over 600

Percentage of Crimes Stratified By Race

The graph above presents the percentage of crime committed by each race. As can be observed, Blacks were responsible for committing 55.94% of crimes, Hispanics 21.99% and White 19.72%.

Conclusion

The aim of this report has been to explore policing behaviour and patterns within Dallas, Texas in 2016. The report did find that blacks were disproportionately

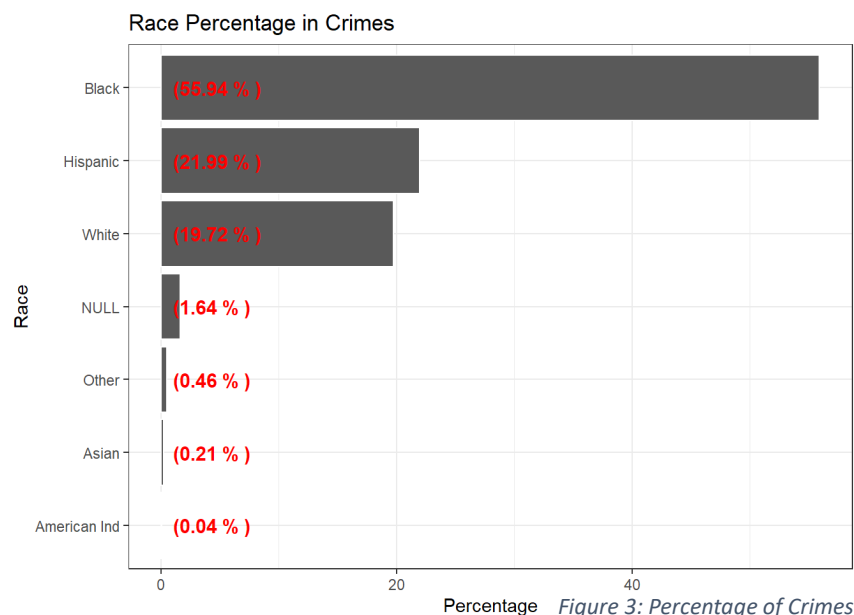


Figure 3: Percentage of Crimes

arrested to other races however an important caveat to note is that the why this is the case was not analysed. Further research will be needed in order to fully understand the disparity which is present.